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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/104,788	06/25/1998	JOHN ADAMS MEYERS	97-ST37	4685

22511 7590 09/23/2004

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EXAMINER


DANG, HOANG C

ART UNIT PAPER NUMBER

3672

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/104,788	Applicant(s) MEYERS ET AL. 	
	Examiner Hoang Dang	Art Unit 3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2004.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21, 23, 25-45, 47, 49-67, 71 and 74-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20, 21, 23, 25-42, 44, 45, 47, 49-64, 66, 67, 69, 71 and 74-76 is/are rejected.
- 7) ☒ Claim(s) 19, 43 and 65 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 27, 2004 has been entered.

**DETAILED ACTION**

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 103***

3. Claims 1-18, 20, 21, 23, 25-42, 44, 45, 47, 49-64, 66, 67, 69, 71 and 74-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skidmore (US 3,955,635) or Tunell (US 4,572,307) in view of Keshavan et al (US 5,370,195) or Hedlund (US 5,575,342) and Larsson (US 4,607,712) or Liljekvist et al (US 4,598,779).

Skidmore or Tunell discloses the invention as claimed except that the exposed portions of the inserts are not enhanced with a superhard material. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the exposed portions of the inserts of Skidmore or Tunell with a layer of superhard material as claimed because it is well known in the well drilling art to provide inserts of a percussion drill bit with a layer of polycrystalline diamond to enhance their wear resistance as evidenced by either Keshavan et al

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(see column 2, lines 35-49 and column 3, lines 3-7) or Hedlund et al (see column 2, lines 58-64 and column 3, lines 28-39).

With respect to the new limitation that "the depth of the second cavities is greater than the depth of the first cavities such that base planes of two adjacent cavities that are selected one each from the first cavities and the second cavities do not intercept in a bit section between the two adjacent cavities", Skidmore does not show the depth of cavities of the inserts. Tunell does not show the depth of the first cavities. However, it is conventional in the drill bit art to mount a larger insert in a larger and deeper cavity in a drill bit body because it is subjected to a greater force than a smaller insert as evidenced by Larsson (see Figure 5) or Liljekvist et al '779 (see Figures 3 and 7).

It is noted that in Skidmore's, if the depth of the cavities for the larger inserts is deeper than that of the smaller inserts as suggested by Larsson or Liljekvist et al, the base planes of two adjacent cavities, i.e., adjacent inserts E and I, or inserts F and J or inserts G and H, that are selected one each from the first cavities and the second cavities of Skidmore clearly will not intercept in a bit section between the two adjacent cavities as claimed since the base plane of the cavity for the larger insert (I, J or H) will at least be below the highest point on the bottom surface of the cavity for the smaller insert (E, F or G, respectively). Similarly, in Tunell's, if the depth of the cavities for the larger inserts is deeper than that of the smaller inserts as suggested by Larsson or Liljekvist et al, the base planes of two adjacent cavities, i.e., adjacent inserts 12 and 14, or inserts 13 and 15, that are selected one each from the first cavities and the second cavities of Skidmore clearly will not intercept in a bit section between the two adjacent cavities as claimed since the base plane of the cavity for the larger insert (14 or 15) will at least be below

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the highest point on the bottom surface of the cavity for the smaller insert (12 or 13, respectively).

As for claims 7-11, 51-35 and 54-58, it would have been obvious to use the dimension or value within the claimed ranges since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As for claims 69 and 71, since the diameter of the second exposed portions of the “second inserts” of Skidmore or Tunell is larger than the diameter of the first exposed portions of the “first inserts” of Skidmore or Tunell, the “ratio of the thickness to the radius of curvature of the second exposed portions is less than the ratio of the thickness to the radius of curvature of the first exposed portions” as recited.

As for claims 74-76, since the larger inserts of Skidmore or Tunell are located outside on the bit face relative to the smaller inserts as that of applicant's, they are inherently arranged as claimed.

### ***Response to Arguments***

4. Applicant's arguments and the Declaration of Lance Underwood under 37 CFR 1.132 with respect to claims 1-18, 20, 21, 23, 25-42, 44, 45, 47, 49-64, 66, 67, 69, 71 and 74-76 have been considered but are moot in view of the new ground(s) of rejection.

Contrary to applicant's argument that there is no motivation to combine Skidmore (or newly-cited Tunell) and Keshavan or Hedlund, either Keshavan or Hedlund clearly teaches providing a cutting insert of a percussion drill bit with a layer of a superhard material to enhance

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its wear resistance (see column 2, lines 35-49 and column 3, lines 3-7 in Keshavan and column 2, lines 58-64 and column 3, lines 28-39 in Hedlund). The motivation is the enhanced wear resistance of the modified inserts.

Applicant further argues that Keshavan teaches the use of PCD enhanced inserts for roller cone drill bits, which are exposed to entirely different loads from those experienced by a percussive drill bit during drilling. This argument is clearly incorrect. Keshavan teaches providing a layer of polycrystalline diamond to cutting inserts of both roller drill bits and percussion drill bits. Applicant's attention is directed to Figure 3 and column 5, lines 24-61 in Keshavan.

Skidmore or Tunell may be silent on the occurrence of fatigue cracks in the bit body as applicant and declarant pointed out. However, when the cavities for the larger and smaller inserts of Skidmore or Tunell's are formed and arranged on bit body as suggested by Larsson or Liljekvist et al, they inherently inhibit or minimize the occurrence of fatigue cracks.

#### ***Allowable Subject Matter***

5. Claims 19, 43 and 65 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

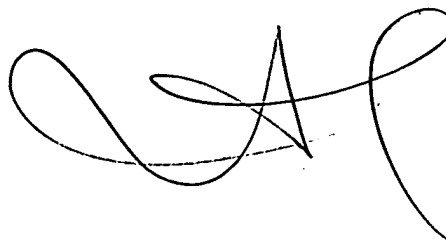
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references are cited to further show that it is conventional in a drill bit art to mount a larger insert in a larger and deeper cavity than that of a smaller insert.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoang Dang whose telephone number is 703-308-2149. The examiner can normally be reached on 9:15-5:45 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Bagnell can be reached on 703-308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hoang Dang  
Primary Examiner  
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A handwritten signature in black ink, appearing to be 'HD', with a large loop on the right side.